International Journal for Research in Education

Volume 44 | Issue 1 Article 9

2020

# The Relationship between Teaching Characteristics and Students' Academic Emotions in the Classroom

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المجلد ( 44 ) العدد ( 1 ) يناير 2020

DOI: http://doi.org/10.36771/ijre.44.1.20-pp250-283

# The Relationship between Teaching Characteristics and Students Academic Emotions in the Classroom

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**Abstract:**

This study investigated the relationship between eight teaching characteristics that have been classified into two categories: the supportive presentation style (SPS) and the Excessive Lesson Demands (ELD) and six academic emotions (enjoyment, pride, anxiety, anger, helplessness, and boredom) acquired by students in classes. In addition, the study investigated the differences between the members of the research sample in the study variables according to the academic field (English language, mathematics and biology). The research sample consisted of 562 the final grade in public high schools in Saudi Arabia, Jeddah. This study conducted a multilevel analysis on a sample of 562 girls to investigate the relationship between the teaching characteristics and the academic emotions for English, Mathematics and Biology domains. Using a paper-based questionnaire and idiographic approach with real-time sampling means, the students were asked for a period of five teaching days about their perceptions of eight teaching characteristics in two groups: SPS and ELD) and about six of their academic emotions. The findings showed a statistically significant relationship between the SPS and ELD characteristics, and among the academic emotions crossing the whole academic domains, but limited differences in the perceptions about the teaching characteristics, with average significant differences about the academic emotions due to the difference in the teaching domains.

*Keywords:* Teaching Characteristics; Students Academic Emotions; different domains Classrooms.

# العلاقة بين خصائص التدريس والانفعالات الأكاديمية للطلاب في الفصل الدراسي

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**مستخلص البحث:**
هدف البحث الحالي إلى الكشف عن العلاقة بين ثمانية من خصائص التدريس التي تم تصنيفها في نمطين الأول: نمط العرض التقديمي الداعم (SPS) ويشمل (مفهوم القابلية للتنفيذ ، الرسوم التوضيحية ، الحماس أو الحرص والاهتمام أو التحفيز) ، ونمط متطلبات الدرس المكثفة (ELD) التي تشمل (عدم الوضوح ، الصعوبة ، السرعة ومستوى التوقعات) وستة من الانفعالات الأكاديمية: (التمتع ، الفخر ، القلق ، الغضب ، العجز ، الملل). التي اكتسبها الطلاب في الفصول الدراسية. بالإضافة إلى دراسة الاختلافات بين أفراد عينة البحث في متغيرات الدراسة حسب المجال الأكاديمي (اللغة الإنجليزية، الرياضيات والبيولوجي). ولتحقيق هذه الأهداف تم استخدام المنهج الوصفي بشقيه الارتباطي والمقارن. وتكونت عينة البحث من (562) بالصف الثالث الثانوى بجدة بالمملكة العربية السعودية ولجمع البيانات تم تطبيق استبيان ورقي وتم مطالبة الطلاب لمدة خمسة أيام تدريسية كتابة تصوراتهم حول نمطي العرض نمط العرض التقديمي الداعم ونمط متطلبات الدرس المكثفة، وكذلك الانفعالات الأكاديمية. وأظهرت النتائج وجود علاقة ذات دلالة إحصائية بين خصائص نمط العرض التقديمي الداعم ونمط متطلبات الدرس المكثفة، وبين المشاعر الأكاديمية في المجالات الأكاديمية المختلفة (اللغة الانجليزية، الرياضيات، البيولوجي)، ووجدت اختلافات محدودة في التصورات حول خصائص التدريس، مع وجود اختلافات كبيرة في المتوسط حول المشاعر الأكاديمية يعزى إلى الاختلاف في المجالات التعليمية. بشكل عام المجالات الثلاثة، كما أظهرت النتائج ,وجود علاقة إيجابية بين بعض خصائص نمط العرض التقديمي الداعم والمشاعر الأكاديمية ، مع وجود ارتباط سلبي بين نمط متطلبات الدرس المكثفة والمشاعر الأكاديمية في بعض المجالات. واختتم البحث بملاحظات ختامية حول التوصيات العملية وقيود الدراسة والاستنتاجات.

*الكلمات المفتاحية:* خصائص التدريس، الانفعالات الأكاديمية للطلاب، مجالات مختلفة من التخصص الفصول الدراسية.

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## Introduction

Prior to the last fifty years, psychologists have rewarded a neglected concern about emotions (Gage & Berliner, 1992; Pekrun, 2014). The ensuing cognitive movement and the behaviorist institutions underplayed and emphasized on the importance and value of emotions particularly in the educational environments (Fried, 2011). In education, classroom is considered as an emotional environment, where students often experience emotions in the different circumstances and settings, and due to dynamic factors probably relevant to the diverse scientific domains or cultures (Pekrun, 2014; Schutz, Hong, Cross, & Osbon, 2006). The emotional relationship and interactions among the students and teachers are of such factors, and the quality emotions and relations in the classroom among involved parties creates the emotional climate of such educational environment (Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008; Goetz, Lüdtke, Nett, Keller, & Lipnevich, 2013).

Students are a central component of the classroom climate, and they may experience and acquire a wide range of positive and/or negative emotions due to diverse and many factors related to their educational climate (Goetz, Zirngibl, Pekrun, & Hall, 2003; Pekrun, 2006). It has been reported by scholars that acquiring academic emotions may affect the learning behaviors of students, have an impact on their academic achievement, and represent an aspect of subjective well-being of the students (e.g., Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Goetz et al., 2013; Pekrun, 2006). As lessening the negative emotions can promote academic productivity (Goetz et al., 2013), there is a need to encourage and motivate students within the classroom climate, and to expand their positive emotions through fostering self-confidence, pleasure, enjoyment and other means (Cosden et al., 2004; Weiner, 1985). Yet, over the different scientific domains and cultures, it has been reported that the characteristics of teaching and learning processes may vary, and thus, the impact of those characteristics and their relationship with the acquisition of positive or negative emotions by students in classroom may also differ (e.g., Goetz et al., 2013; Pekrun, 2006; Reyes, Brackett, Rivers, White, & Salovey, 2012).

After a quick review and background on the topic, the paper explores the types of emotions students may acquire, the characteristics of teaching and learning processes, the nature of interactions between students and teachers, and the link between the motional climate of classroom and academic achievements of students. The paper then describes the research methodology and tools, data collection and analysis procedures, and detailed discussions on the results and findings. The paper finally provides key recommendations and conclusions.

## Study purpose

This study investigates:

1. The relationship between teaching characteristics and the emotions of students acquired by students in those classes.
2. Differences between the students' emotions and the teaching characteristics in classroom due to the educational domains: English, Biology and Mathematics.

## Study Importance

The importance of research variables is represented in:

1. There may be a reciprocal relationship between characteristics of teaching and students' emotions in the classroom, with the former serving as both the antecedent and the consequence of the latter. That is, not only can teaching elicit specific affect from students but students' emotions may have an influence on teaching, either directly or as mediated by cognitions
2. The impact of students' emotions on teachers' behavior, students' academic emotions may also influence judgments about the teaching quality.

## Background

There were several studies discussing the ways to employ different teaching and learning strategies to develop positive emotions that may assist students and foster their academic performance (Gross, 1998; Goetz, Frenzel,

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Pekrun, Hall, & Lüdtke, 2007; Goetz et al., 2013; Matthews, Zeidner, & Roberts, 2002). Teachers for example may display some enthusiasm and keenness towards students, and they may use different teaching and learning means such as illustrations and graphics to boost positive emotions and make the process of learning a joy (Sutton & Wheatley, 2003; Thompson et al., 2009; Zins, Bloodworth, Weissberg, & Walberg, 2007) a known Proverb says that "A wise teacher makes learning a joy''. Thus, despite academic achievement and performance are often considered as a characteristic of students, the educational result of the teaching and learning processes remain to be affected by students' emotions they may acquire, and by the characteristics of those processes as delivered by teachers (Goetz et al., 2007; Reeve, Jang, Carrell, Jeon, & Barch, 2004; Urdan & Schoenfelder, 2006).

Several scholars from of the educational psychology focused on identifying the characteristics of teaching and learning processes across different scientific domains and their relationship with the acquisition of positive or negative emotions by students (e.g., Goetz et al., 2003; Goetz et al., 2013; Pekrun et al., 2002; Reyes et al., 2012). Some studies for example reported a positive relationship between the proper classroom environment and the students' emotions, using the Control Value Theory; a study found that academic achievements and performance of the students can be enhanced through fostering a higher quality of teaching and engagement (Pekrun, 2006). Others found that the behavior and interactions of the teachers during the teaching and learning processes in the classroom are of impact on the achievements of the students (Brophy & Good, 1986). Another study found focused on the relationship between the teaching quality and classroom setting or environment for different scientific domains and the emotions may acquire by the students from different cultures or countries (e.g. Goetz et al., 2013; Pekrun, 2014; Schutz et al., 2006).

**Academic Emotions**

Earlier studies reported four groups of academic emotions acquired by students during the teaching and learning processes: Achievement, Epistemic, Topic and Social emotions (Lewis, Haviland-Jones, & Feldman

Barrett, 2008; Pekrun & Linnenbrink-Garcia, 2012; Weiner, 2007). Achievement emotions are related to the failures and successes resulted through the teaching and learning activities. While satisfaction, hope and pride are associated with success, shame, stress and anxiety are associated with failure (Pekrun, 2006). Those emotions are embedded within the academic settings mainly when the failure or successes are made obvious to students (Pekrun & Linnenbrink-Garcia, 2012).

Epistemic emotions are triggered or caused by cognitive problems; those are acquired in the form of confusion, frustration and curiosity about challenging understanding or in the form of pleasure and enjoyment when such understanding is resolved (Lewis et al., 2008). Those emotions are critical when learning non-routine or new tasks (Litman, Hutchins, & Russon, 2005). Topic emotions are related to issues or topics presented during lessons or in classrooms; empathy for example may occur due to the use of nature portrayed or as a result of painting in the art course, while anxiety may appear when dealing with medical tools or diseases (Elias et al., 1997).

Social emotions are related to peers and teachers in classroom; examples may include compassion, love, admiration, sympathy, anger, contempt, social anxiety or envy. The social emotions are of particular importance mainly with reference to the teacher–student interaction and the group-based learning (Brackett & Rivers, 2013). It has been reported that the social emotions are deeply related to the interactions between the student and teacher in the classroom and among the students (Vermette et al., 2001). Regardless negative or positive, those emotions in particular have been reported with effect on the success of the teaching and learning processes (Zins, Weissberg, Wang, & Walberg, 2004).

Based on the analysis of literature in this domain (e.g., Pekrun, 2006; Weiner, 2007; Lewis et al., 2008; Pekrun & Linnenbrink-Garcia, 2012), six academic emotions of students were identified (Enjoyment or Pleasure, Pride or Self-importance, Anxiety or Nervousness, Anger or Annoyance, Helplessness or Vulnerable and Boredom or Dullness).

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**Teaching Characteristics**

Several models have been developed to articulate the dynamics and characteristics of the teaching and learning processes. The Model of School Learning identified one input (aptitude), four intermediate (learning opportunity, understanding instruction, instructions quality, and perseverance) and one output (academic achievement) variable of the overall process (Carroll, 1963). The Teacher Expectations Model focused on how the school climate and the expectations of classroom may influence or impact on the academic performance of students (Proctor, 1984). Profile of an Effective Teacher as another model concerned with the classroom management and informative teaching with shedding the light on the behavioral interactions between teachers and students (Cruickshank, 1985).

Other models elucidating the characteristics of teaching and learning processes focused on the quality of instructions and how or what the teachers do in the classrooms to deliver those instructions (Gage & Berliner, 1992), and on the teaching and learning context, student and teachers characteristics, and their relationship with the academic achievement (Huitt, 1995).

Nevertheless, according to the educational psychologists, most of those models agreed on several characteristics of the teaching and learning processes in relationship to students and their emotions. Based on the analysis of those models and literature in this domain (e.g., Goetz et al., 2013; Matthews et al., 2002; Pekrun, 2007; Pekrun & Linnenbrink-Garcia, 2012; Reeve et al., 2004), this paper concluded eight teaching and learning characteristics categorized in two groups: Supportive Presentation Style (SPS) (comprising Understandability, Illustrations or Graphics, Enthusiasm or Keenness and Attention or Stimulation), and Excessive Lesson Demands (ELD) (comprising Lack of Clarity, Difficulty, Rapidity and Level of Expectation).

**Domain-Specific Aspects**

Despite several models discussed and identified the characteristics of the teaching and learning processes, some domains remain to have their own aspects (McIlrath & Huitt, 1995). For example, in English domain, teaching

and learning language and texts are the essential and central concepts. The texts concept equally concentrates on analyzing and creating texts, understanding and interpreting texts, and moving beyond interpretation to critical and reflectivity. The language concept includes developing the linguistic competence and knowledge and using the language. Thus, students are learning to enjoy, appreciate, use language and consequently develop a sense of its power and richness, to evoke emotions, to inform and entertain, and to persuade and argue (State of Victoria, 2010).

In Mathematics, it has been reported that geometry classes hide the attractiveness and form emotionally and mentally challenges for students (Lockhart, 2008). The process of teaching and learning mathematics is also a gradual process taking accumulative manner with complex understandings, and consequently generating cruel feelings and preventive behaviors against learning by the student (Butterworth & Bevan, 2004). In Biology, teaching and learning processes involve experiments studying classification, function, behavior, evolution and structure of diverse beings, and thus teachers are required to employ a range of educational arts and illustrations (Li, 2009). So, teaching and learning processes and the emotions of students are mostly domain-dependent. Domain-specific characteristics are expected to stimulate the interest of students to learn and practice, and inspire them to explore and discover with fun and enjoyment in that domain (Yang, 1997). In addition, teaching and learning techniques and tools in one domain may more encourage students to learn than in other domain(s). In History domain for example, storytelling is a successful technique, and this influences students to learn, and make teachers more comfortable to present facts about civilization (Yang, 1998). Several known scholars had published their work with focus on domain-specific attractive attributes to encourage students towards studying such domains; examples of such works include “Beauty and Physics” in Physics, “My Admiration for the Beauty and Power of Math” in Mathematics and “Number One Propel” in Biology (Zhu, Tan, Li, & Tian, 2002). Those publications focused on the use of different teaching and learning tools, creating and managing classroom and climate, and encouraging students and stimulating their emotions (Li, 2009).

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**Classroom Climate and Interactions**

Earlier studies showed limited impact of the teacher demographics and credentials on the academic performance and results of students (e.g., (Gilliam & Marchesseault, 2005). Thus, several studies concentrated on classroom climate as social environment for the interactions between teachers and students; this is consequently expected to promote academic results (Brophy, 1988; Huang & Moon, 2009; Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008;). Organizational and instructional classroom aspects around the students have been studied as factors to motivate and influence higher achievements and understanding, and for retrieving prior knowledge and instructions by students (Zohar & Dori, 2003). The interactions within classroom climate have also been reported as an emotional and supportive factor to establish proper educational environment (Battistich, Schaps, & Wilson, 2004).

Yet, student–teacher interactions are ruled by the emotional climate they create in the classroom, and consequently impact on the achievements (Goodenow, 1993; Greenberg, 2009; Jennings & Shonkoff & Phillips, 2000; Pianta et al., 2008; Reyes et al., 2012; Urdan & Schoenfelder, 2006). Therefore, the teachers forming positive and emotional climate for learning demonstrate keenness and enthusiastic to the learning process (Jennings & Greenberg, 2009), and then, students will be able to feel more engaged and connected and can become more active and flourishing academically. Supportive, caring and emotionally oriented teachers are also able to make sense of belonging for students and make them feel emotionally engaging and attached within the learning procedure (Battistich et al., 2004; Goodenow, 1993; Jennings, 2003). Indeed, since the early years of schools, students may display emotional manner with emotional bond through their teachers and due to the characteristics of the teaching and learning processes adopted by those teachers (Birch & Ladd, 1997; Hamre & Pianta, 2001).

**Research Hypotheses**

Through the above research model and research measures, this study hypothesizes and attempts to test the following two major hypotheses through

data analysis:

1. Hypothesis (H1): the characteristics of the teaching processes in classroom are related to the academic emotions acquired by students in those classes.
2. Hypothesis (H2): there are significant differences in the relationship between the students' emotions and the teaching characteristics in classroom due to the educational domains: English, Biology and Mathematics.

This implies that students are expected to display positive and significant academic emotions (mainly Enjoyment and Pleasure, Pride and Self-importance) when they experience apt teaching characteristics in classrooms (including Understandability, Illustration and Graphics, Enthusiasm and Keenness, and Attention Stimulation and Level of Expectation); otherwise, those academic emotions will be negative (mainly Anxiety and Nervousness, Anger and Annoyance, Helplessness and Vulnerable and Boredom and Dullness) when the teaching characteristics are also negative (including Lack of Clarity, Difficulty and Rapidity). This hypothesis will also be tested using results from the assessment of the situations in girls' public high schools for in Saudi Arabia.

## Method

### Research Design

The goal of this study is to collect and analyze data about characteristics within particular fields and settings. Therefore, this study is descriptive to look at the situations in classroom as they naturally happen. The descriptive design can be used to build a theory, identify and present practice issues, make judgments, explain current practice or articulate the actions of others in certain situations (Burns & Grove, 2001).

### Research Model

On the light of the above review and analysis of literature, it can be seen that when students are living within emotionally oriented learning

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climate, they will feel more attached. Teaching characteristics can be domain-specific and may create varying academic emotions and emotional climate. Further, teacher–student interactions are one of the dominant characteristics of the teaching and learning processes within the educational environment.

For the purpose of this study as explained above, eight teaching characteristics were identified, and six academic emotions of students were also identified. Therefore, examining the link between the teaching characteristics and the academic emotions of students is vital, mainly when looking at different domains such as English, Mathematics and Biology as key scientific areas in education with diversity. Figure 1 illustrates the research model or framework developed based on the earlier studies for the purpose of this study; this is followed by the research measures, instrument and hypotheses to be tested through real data collection and analysis. In Figure 1 as a research model, it can be seen that:

- The “Teaching Characteristics” works as Independent Variable
- The “Academic Emotions” works as dependent variable
- the “Domain” works as moderator factor with possible impact on the link between the independent and dependent variables.

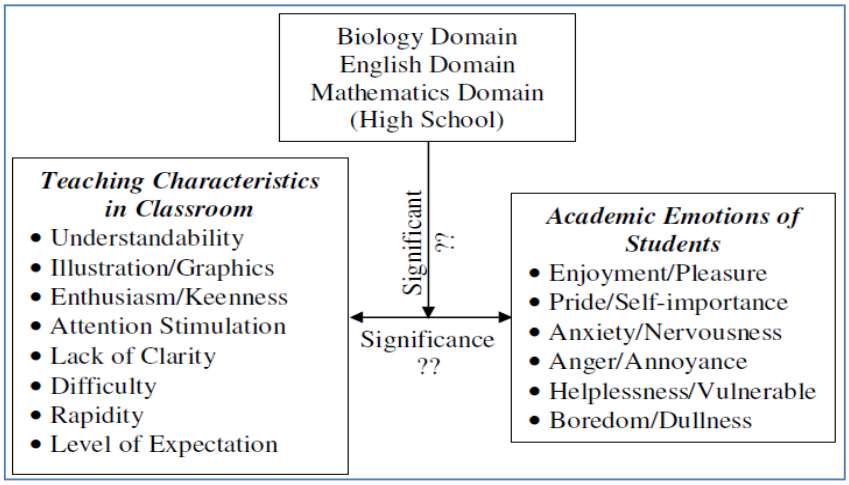


*Figure 1*: Research Model*

(*Source: Developed by the Author)

## Population and Sample

The population of this study involved 562 female students with ability to read, write and understand Arabic surveys and have the ability to respond to the survey questions during the teaching hours. Those female students were registered in public schools for their final year of study; i.e., they are in their high school grade and expected to have acceptable awareness level on the topic under investigation. The randomly selected samples were form English, Mathematics and Biological classes at four schools with permit from the educational administration at their schools.

## Instrument

The study considered and conducted data analysis on three variables of measures: teaching characteristics, teaching domains and the emotions of students. The data collection about those measures was based on the experiences and different situations over a period of time within classrooms, and not based on specific moment or single situation of teacher–student interaction. The selection of the three domains (Biology, English and Mathematics) was based on the fact that those three domains involve the natural, literature and intellectual learning, i.e., as a concrete combination.

For the purpose of this study, a quantitative data collection instrument was developed, i.e., Survey, as a research method for data collection. The survey comprised two main parts: the first part is to collect data about the teaching characteristics in classrooms (consists of eight statements, i.e., one statement per characteristic), and the second part is to collect data about academic emotions of students (consists of six statements, i.e., one statement per emotion). The research participants were asked to provide their perceptions and level of agreement on the statements towards the three domains using 5-Points Likert Scale, where “1” meant “Strongly Disagree” up to “5” meant “Strongly Agree”.

## Data Collection

The data was collected by the researcher where each participant was given a pencil to answer the questionnaire sheet; around 562 survey sheets

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were distributed directly to the students during the class times with the teachers help at four public schools in Saudi Arabia, Jeddah after explaining the research aim, privacy and confidentiality issues, and other concerns related to the data analysis and reporting. This approach is a real-time sampling used to record the immediate emotional experiences by students in classes for all domains; this is also known as idiographic approach or event sampling and experience for data collection procedure. This idiographic approach with the use of event sampling technique allows examining the patterns in the intra-individual perceptions of students towards the teaching characteristics and about the academic emotions experienced by those students in real-time classroom settings, see (Lamiell, 1998) for more details on this procedure. The answered sheets were then collected after clarifying the questions to the students when available. Data collection was conducted during the classes in the classrooms to get the immediate and thus, most reliable answers and honest emotions of the students. The questionnaire sheets then were collected out from the students.

**Data Analysis**

Only four surveys were excluded from data analysis due to incomplete answers; i.e., only 558 surveys were included in the analysis. The data then were transferred into Statistical Package for Social Studies software (SPSS 22). After conducting the reliability test using Cronbach's Alpha, the data analysis was conducted at two main levels.

The first level of analysis focused on the descriptive statistics of the SPS (i.e., Supportive Presentation Style), ELD (i.e., Excessive Lesson Demands) and overall teaching characteristics, then on the individual and overall academic emotions of the students; the descriptive analysis was done for individual domain and overall domains, and compared among those domains. The second level of analysis focused on the link between each individual and overall academic emotions of students at one side, and the SPS, ELD and overall teaching characteristics at the other side; this analysis was done for each individual domain and overall domains.

## Reliability Test

The study used Cronbach's Coefficient Alpha (α) statistical test for reliability; a 0.7< α< 0.95 threshold was adopted here where the low Cronbach's α (i.e., lower than 0.60) may indicate poor construct definition or a multi-dimensional construct in the survey, and a very high Cronbach's α (above 0.95) may suggest the presence of common methods bias (Moore & Benbasat, 1991; Straub, Boudreau & Gefen, 2004). Table 1 illustrates the results of the reliability test to assess the internal consistency of the items for the teaching characteristics and academic emotions. The results show that all Cronbach's α score were within the target range for both the teaching characteristics (α = 0.92, with α = 0.89 for the SPS and α = 0.91 for the ELD), and for the academic emotions (α = 0.88). The scales indicate the variables in the survey fit for the research problem.

Table 1

*Cronbach's Alpha for Reliability Test*

| Variables | | α |
|---|---|---|
| Teaching Characteristics | SPS–Supportive Presentation Style | 0.89 |
| | ELD–Excessive Lesson Demands | 0.91 |
| | Total | 0.92 |
| Academic Emotions of Students | | 0.88 |

# Results

## The Participants

The initial sample was consisted of around 600 female students at four schools. Among these, 562 participants were considered for this study after excluding the data from incomplete four surveys. For the counted participants, 100% were females registering for their final grade of school or high school level, and no more demographics were collected about those females.

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**Level I Analysis**

The teaching characteristics were measured with direct items asking about the SPS (i.e., Supportive Presentation Style) (4 items) and the ELD (i.e., Excessive Lesson Demands) (4 items). These variables relate to the understandability of the materials by the teacher, illustrations or graphics used to deliver the scientific message, enthusiasm or keenness of the teacher and attention or stimulation motivated by the teaching techniques, and about the lack of clarity of the materials, difficulty to understand by the students, rapidity of the teaching process and level of students' expectations.

The means (M), standard deviations (SD) and assessment for the SPS and ELD are illustrated in Table 2, for the overall scientific domains and individually. The results demonstrated that the participants were generally positive (i.e., Medium) about the SPS, ELD and overall teaching characteristics for all domains, respectively, with an aggregated averages of M=3.10, 3.61 and 2.58, and respectively standard deviations of SD=0.58, 0.85 and 0.93.

Table 2

*Descriptive Statistics for the Teaching Characteristics*

| | M | SD | Status | |
|---|---|---|---|---|
| English | 3.33 | 1.18 | Medium | |
| Mathematics | 3.66 | 0.98 | Medium | |
| Biology | 3.83 | 0.96 | High | SPS |
| All Disciplines | 3.61 | 0.85 | Medium | |
| English | 2.55 | 0.48 | Medium | |
| Mathematics | 2.70 | 1.08 | Medium | |
| Biology | 2.48 | 0.91 | Medium | ELD |
| All Disciplines | 2.58 | 0.93 | Medium | |
| English | 2.94 | 0.48 | Medium | |
| Mathematics | 3.18 | 0.95 | Medium | |
| Biology | 3.16 | 0.53 | Medium | Overall |
| All Disciplines | 3.10 | 0.58 | Medium | |

The results in Table 2 also demonstrated that the participants in Biology classes were positive about the ELD and the overall teaching characteristics with respectively an aggregated averages of M=3.16 and 2.48, and respectively standard deviations of SD=0.53 and 0.91, but highly positive about the SPS with an aggregated average of M=3.83 and standard deviations of SD=0.96. The participants in English and Mathematics classes also showed positive perception about the SPS, ELD and the overall teaching characteristics with respectively an aggregated averages of M=2.94, 3.33 and 2.5 for English and 3.18, 3.66 and 2.70 for Mathematics, and respectively standard deviations of SD=0.48, 1.18 and 0.48 for English and SD=0.95, 0.98 and 1.08.

The results in Table 3 indicate that the perceptions of females are significantly more positive towards the SPS characteristics in Mathematics classes than in English classes with t=7.64 (p-value < 0.05); and in Biology classes than in both Mathematics and English classes with, respectively, t=5.46 (p-value < 0.05) and t=11.78 (p-value < 0.05). These results were the same for the ELD characteristics, i.e., the perceptions of females are significantly more positive in Mathematics classes than in English classes with t=6.39 (p-value < 0.05); and in Biology classes than in both Mathematics and English classes with, respectively, t=4.70 (p-value < 0.05) and t=6.48 (p-value < 0.05).

Table 3

*Descriptive Comparison for the Teaching Characteristics – All Domains*

| Teach. Char. | T | | |
|---|---|---|---|
| | EM | EB | MB |
| SPS | 7.64* | 11.78* | 5.46* |
| ELD | 6.39* | 6.48* | 4.70* |
| Overall | 2.64* | 6.14* | 4.70* |

**Statistical Significance at 0.05 levels (2-tailed)*

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For the overall teaching characteristics, the results as in Table 3 also showed that the perceptions of females are significantly more positive in Biology classes than in English classes with t=6.14 (p-value < 0.05); and in Mathematics classes than in both Biology and English classes with, respectively, t=4.70 (p-value < 0.05) and t=2.64 (p-value < 0.05).

The academic emotions of students were measured with direct items asking about this variable (6 items); these items relate to the enjoyment, pride, anxiety, anger, helplessness and boredom emotions. The means (M), standard deviations (SD) and assessment for the overall emotions and individually are illustrated in Table 4, for the individual and overall scientific domains. The results demonstrated that the participants were generally positive (i.e., Medium) about the overall academic emotions for Biology, Mathematics, English and all disciplines together with respectively an aggregated average of M=2.70, 2.79, 2.87 and 2.79, and respectively standard deviations of SD=0.67, 0.60, 0.47 and 0.56. The results also indicate that the highest average was for "Pride" with (M=3.34 and SD=1.06) for all disciplines, "Pride" with (M=3.18 and SD=1.53) for English classes, "Pride" with (M=3.35 and SD=1.30) for Mathematics classes, and "Pride" with (M=3.48 and SD=1.22) for Biology classes. The lowest average was for "Helplessness" with (M=2.42 and SD=1.05) for all disciplines, "Helplessness" with (M=2.66 and SD=1.60) for English classes, "Anger" with (M=2.44 and SD=1.35) for Mathematics classes, and "Helplessness" with (M=2.15 and SD=1.21) for Biology classes.

Tables 4

*Descriptive Statistics for Academic Emotions*

| Academic Emotions | M | SD | Status | |
|---|---|---|---|---|
| Enjoyment | 3.20 | 0.92 | Medium | All Disciplines |
| Pride | 3.34 | 1.06 | Medium | |
| Anxiety | 2.61 | 1.15 | Medium | |
| Anger | 2.49 | 1.11 | Medium | |
| Helplessness | 2.42 | 1.05 | Medium | |
| Boredom | 2.71 | 1.04 | Medium | |
| All Emotions | 2.79 | 0.56 | Medium | |
| Enjoyment | 2.95 | 1.48 | Medium | English |

| Academic Emotions | M | SD | Status | |
|---|---|---|---|---|
| Pride | 3.18 | 1.53 | Medium | |
| Anxiety | 2.91 | 1.60 | Medium | |
| Anger | 2.68 | 1.61 | Medium | |
| Helplessness | 2.66 | 1.60 | Medium | |
| Boredom | 2.88 | 1.56 | Medium | |
| All Emotions | 2.87 | 0.47 | Medium | |
| Enjoyment | 3.20 | 1.20 | Medium | |
| Pride | 3.35 | 1.30 | Medium | |
| Anxiety | 2.60 | 1.39 | Medium | Mathematics |
| Anger | 2.44 | 1.35 | Medium | |
| Helplessness | 2.45 | 1.27 | Medium | |
| Boredom | 2.73 | 1.29 | Medium | |
| All Emotions | 2.79 | 0.60 | Medium | |
| Enjoyment | 3.44 | 1.21 | Medium | |
| Pride | 3.48 | 1.22 | Medium | |
| Anxiety | 2.32 | 1.33 | Medium | |
| Anger | 2.34 | 1.31 | Medium | Biology |
| Helplessness | 2.15 | 1.21 | Medium | |
| Boredom | 2.52 | 1.32 | Medium | |
| All Emotions | 2.70 | 0.67 | Medium | |

The results in Table 5 indicate that the "Enjoyment" academic emotions of the females are significantly more positive in Biology classes than in both English and Mathematics classes with t=7.01 (p-value < 0.05) and t=3.84 (p-value < 0.05); and in Mathematics classes than in English classes with t=3.59 (p-value < 0.05). These results were the same for the "Pride" academic emotions of the females, i.e., the "Enjoyment" academic emotions of the females are significantly more positive in Biology classes than in both English and Mathematics classes with t=4.12 (p-value < 0.05) and t=1.96 (p-value < 0.05); and in Mathematics classes than in English classes with t=2.28 (p-value < 0.05).

Table 5

*Descriptive Comparison for the Academic Emotions – All Domains*

| Emotions | EM | EB | MB |
|---|---|---|---|
| | 3.59* | 7.01* | 3.84* |
| Enjoyment | 2.28* | 4.12* | 1.96* |

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| | | | |
|---|---|---|---|
| Pride | 4.03* | 7.63* | 3.82* |
| Anxiety | 3.16* | 4.40* | 1.33 |
| Anger | 2.83* | 6.87* | 4.56* |
| Helplessness | 2.07* | 4.83* | 3.06* |
| Boredom | 3.21* | 6.46* | 3.93* |

*Statistical Significance at the 0.05 level (2-tailed)

On the other hand, the results as in Table 5 indicated that the "Anxiety", "Anger", "Helplessness" and "Boredom" academic emotions were more in English classes than in Mathematics and Biology classes; and Mathematics than in Biology classes.

**Level II Analysis**

**Relationships for Overall Domains**

The results in Table 6 illustrate Pearson Correlations between the academic emotions of the students and the teaching characteristics in classes of all domains together. The results showed in regard to the relationship between the academic emotions of the students and the overall teaching characteristics in classes of all domains that "Boredom" is the only academic emotion with no statistical correlation with the overall teaching characteristics, i.e., accepting the first hypothesis for all academic emotions in all domains. The results indicate that there is a statistically positive and significant correlation between the SPS and the "Enjoyment" and "Pride" emotions with ($\alpha \leq 0.05$) and t=0.47 and 0.61, respectively. There is a statistically negative and significant correlation between the SPS and the other academic emotions with ($\alpha \leq 0.05$) and t=-0.33, -0.30, -0.30 and -0.33 for the "Anxiety", "Anger", "Helplessness" and "Boredom", respectively. The results also indicate that there is a statistically negative and significant correlation between the ELD and the "Enjoyment" and "Pride" emotions with ($\alpha \leq 0.05$) and t=-0.08 and -0.25, respectively. There is a statistically positive and significant correlation between the ELD and the other academic emotions with ($\alpha \leq 0.05$) and t=0.43, 0.50, 0.47 and 0.34 for the "Anxiety", "Anger", "Helplessness" and "Boredom" academic emotions, respectively.

Table 6

*Pearson Correlations for Academic Emotions and Teaching Characteristics*

| Emotions | SPS | ELD | Overall |
|---|---|---|---|
| Enjoyment | 0.47* | -0.08* | 0.35* |
| Pride | 0.61* | -0.25* | 0.33* |
| Anxiety | -0.33* | 0.43* | 0.08* |
| Anger | -0.30* | 0.50* | 0.18* |
| Helplessness | -0.30* | 0.47* | 0.15* |
| Boredom | -0.33* | 0.34* | 0.01 |

**Correlation is significant at 0.01 levels (2-tailed).

*Correlation is significant at 0.05 levels (2-tailed).

**Relationships in English Classes**

The results in Table 7 illustrate Pearson Correlations between the academic emotions of the students and the teaching characteristics in English classes. The results showed that "Boredom" and "Anxiety" are the only academic emotions with no statistical correlation with the overall teaching characteristics with ($\alpha \leq 0.05$) and t=0.04 and 0.06, respectively; i.e., accepting the second hypothesis for "Enjoyment", "Pride", "Anger" and "Helplessness" academic emotions in English domain. The results also indicate that there is a statistically positive and significant correlation between the SPS and the "Enjoyment" and "Pride" emotions with ($\alpha \leq 0.05$) and t=0.32 and 0.47, respectively. There is a statistically negative and significant correlation between the SPS and the other academic emotions with ($\alpha \leq 0.05$) and t=-0.27, -0.31, -0.26 and -0.24 for the "Anxiety", "Anger", "Helplessness" and "Boredom", respectively. The results also indicate that there is a statistically negative and significant correlation between the ELD and the "Enjoyment" and "Pride" emotions with ($\alpha \leq 0.05$) and t=-0.09 and -0.28, respectively. There is a statistically positive and significant correlation between the ELD and the other academic emotions with ($\alpha \leq 0.05$) and t=0.37, 0.43, 0.42 and 0.30, respectively, for the "Anxiety", "Anger", "Helplessness" and "Boredom".

Table 7

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*Pearson Correlation for Academic Emotions and Teaching Characteristics – English*

| Emotions | SPS | ELD | Overall |
|---|---|---|---|
| Enjoyment | 0.32* | -0.09* | 0.24* |
| Pride | 0.47* | -0.28* | 0.21* |
| Anxiety | -0.27* | 0.37* | 0.06 |
| Anger | -0.31* | 0.43* | 0.09* |
| Helplessness | -0.26* | 0.42* | 0.12* |
| Boredom | -0.24* | 0.30* | 0.04 |

**Correlation is significant at 0.01 levels (2-tailed).

*Correlation is significant at 0.05 levels (2-tailed).

**Relationships for Mathematics Domain**

The results in Table 8 illustrate Pearson Correlations between the academic emotions of the students and the teaching characteristics in Mathematics classes. The results showed that "Boredom" and "Anxiety" are also the only academic emotions with no statistical correlation with the overall teaching characteristics with ($\alpha \leq 0.05$) and t=-0.06 and 0.07, respectively; i.e., accepting the second hypothesis for "Enjoyment", "Pride", "Anger" and "Helplessness" academic emotions in Mathematics domain. The results also indicate that there is a statistically positive and significant correlation between the SPS and the "Enjoyment" and "Pride" emotions with ($\alpha \leq 0.05$) and t=0.44 and 0.52, respectively. There is a statistically negative and significant correlation between the SPS and the other academic emotions with ($\alpha \leq 0.05$) and t=-0.27, -0.19, -0.24 and -0.31 for the "Anxiety", "Anger", "Helplessness" and "Boredom", respectively. The results also indicate that there is a statistically negative and significant correlation between the ELD and the "Enjoyment" and "Pride" emotions with ($\alpha \leq 0.05$) and t=-0.08 and -0.23, respectively. There is a statistically positive and significant correlation between the ELD and the other academic emotions with ($\alpha \leq 0.05$) and t=0.38, 0.43, 0.41 and 0.27 for the "Anxiety", "Anger", "Helplessness" and "Boredom" academic emotions, respectively.

Tables 8

*Pearson Correlation for Academic Emotions and Teaching Characteristics – Mathematics*

| Emotions | SPS | ELD | Overall |
|---|---|---|---|
| Enjoyment | 0.44* | -0.08* | 0.34* |
| Pride | 0.52* | -0.23* | 0.28* |
| Anxiety | -0.27* | 0.38* | 0.07 |
| Anger | -0.19* | 0.43* | 0.19* |
| Helplessness | -0.24* | 0.41* | 0.12* |
| Boredom | -0.31* | 0.27* | -0.06 |

**Correlation is significant at 0.01 levels (2-tailed).

*Correlation is significant at 0.05 levels (2-tailed).

**Relationships for Biology Domain**

The results in Table 9 illustrate Pearson Correlations between the academic emotions of the students and the teaching characteristics in Biology classes. The results showed that "Boredom" and "Anxiety" are again the only academic emotions with no statistical correlation with the overall teaching characteristics with ($\alpha \leq 0.05$) and t=-0.03 and 0.07, respectively; i.e., accepting the second hypothesis only for "Enjoyment", "Pride", "Anger" and "Helplessness" academic emotions in Biology domain. The results also indicate that there is a statistically positive and significant correlation between the SPS and the "Enjoyment" and "Pride" emotions with ($\alpha \leq 0.05$) and t=0.41 and 0.52, respectively. There is a statistically negative and significant correlation between the SPS and the other academic emotions with ($\alpha \leq 0.05$) and t=-0.27, -0.21, -0.24 and -0.25 for the "Anxiety", "Anger", "Helplessness" and "Boredom", respectively.

The results also indicate that there is a statistically negative and significant correlation between the ELD and only "Pride" emotion with ($\alpha \leq 0.05$) and t=-0.12, and there is no statistical correlation in case of "Enjoyment" with ($\alpha \leq 0.05$) and t=-0.02. There is a statistically positive and significant correlation between the ELD and the other academic emotions with ($\alpha \leq 0.05$) and t=0.36, 0.43, 0.40 and 0.29 for the "Anxiety", "Anger", "Helplessness" and "Boredom", respectively. Table 10 illustrates briefly the outcomes of level II analysis for the correlations between the teaching

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characteristics and academic emotions, with the hypotheses testing results in the three domains.

Tables 9

*Pearson Correlation for Academic Emotions and Teaching Characteristics – Biology*

| Emotions | SPS | ELD | Overall |
|---|---|---|---|
| Enjoyment | 0.41* | -0.02 | 0.32* |
| Pride | 0.52* | -0.12* | 0.34* |
| Anxiety | -0.27* | 0.36* | 0.06 |
| Anger | -0.21* | 0.43* | 0.17* |
| Helplessness | -0.24* | 0.40* | 0.12* |
| Boredom | -0.25* | 0.29* | 0.03* |

**Correlation is significant at 0.01 levels (2-tailed).

*Correlation is significant at 0.05 levels (2-tailed).

Table 10

*Summary of Level II Analysis and Hypotheses Status*

| | | Academic Emotions | | | | | |
|---|---|---|---|---|---|---|---|
| | | Enjoy. | Pride | Anxi. | Anger | Helpl. | Bored. |
| English | SPS | P | P | P | P | P | P |
| | ELD | P | P | P | P | P | P |
| | All | P | P | P | P | P | P |
| Math. | SPS | P | P | P | P | P | P |
| | ELD | P | P | P | P | P | P |
| | All | P | P | P | P | O | O |
| Biology | SPS | P | P | P | P | P | P |
| | ELD | P | P | P | P | P | P |
| | All | P | P | P | P | O | O |

P = Accepting Hypothesis, O = Rejecting

## Discussions

This study investigated the link between the teaching characteristics and the academic emotions of female students using the idiographic approach

and real-time event experience sampling. The study attempted to examine the link between those variables with respect to three specific academic domains in Saudi public high schools: English, Mathematics and Biology. The focus was in particular on those teaching characteristics motions based on many scholarly publications in the literature reporting on their importance with impact on the academic emotions of students (e.g., Goetz et al., 2013; Lewis et al., 2008; Matthews et al., 2002; Pekrun, 2006; Pekrun, 2007; Pekrun & Linnenbrink-Garcia, 2012; Reeve et al., 2004; Weiner, 2007). Therefore, a hypothesized link was tested in this study to identify the significance of the SPS (i.e., Supportive Presentation Style) and ELD (i.e., Excessive Lesson Demands) as teaching characteristics on six academic emotions of students may experience in classrooms for the three disciplines.

The findings in this study confirmed an average positive perception of the research participants towards the SPS and ELD teaching characteristics, as well as about the overall teaching characteristics for all domains, and only in case of biology, the perception of the participant towards the SPS was positively high. With reference to the academic emotions, the findings demonstrated average positive feelings of the female students towards the individual and overall academic emotions in for every domain and as overall. Yet, “Pride” and “Enjoyment” academic emotions perceived by the females were significantly more positive in Biology classes than in both English and Mathematics classes, while the other academic emotions were more significantly positive in Biology classes.

In consistence with the first hypothesis, the study identified a significant relationship between the overall teaching characteristics and the overall academic emotions of students across the overall academic domains. The findings in this study are in alignment with the findings of other studies that confirmed such strong links (e.g., Goetz et al., 2013; Pekrun, 2006; Pekrun & Linnenbrink-Garcia, 2012). While the study supported the second hypothesis for only English domain, stating that there is a strong link between the teaching characteristics and academic emotions, the second hypothesis was rejected in case of Mathematics and Biology classes.

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Similar to other studies (e.g., Goetz et al., 2013: Togneri & Anderson, 2003; Leithwood et al., 2004; Manning et al., 2010;), the teaching characteristics were grouped into SPS and ELD, and then tested their link with the individual and overall academic emotions of students. The results confirmed about the existence of positive and significant association between the SPS and the "Enjoyment" and "Pride" emotions; another study also supported the same findings (Oriol et al., 2016). This result can be due to the presentation-based style where the students are able to confront their peers and teacher, and then extend their ability to show their character and personality; this finding is in parallel with findings in other studies (e.g., Ahmed, 1998; Seaman, 1998; Smith & Woody, 2000). On the other hand, the study confirmed a negative link between the SPS and the "Anxiety", "Anger", "Helplessness" and "Boredom" emotions; it seems that those emotions emerge due to the use of traditional teaching techniques where the participation of students is limited (Stoloff, 1995; Szabo & Hastings, 2000).

The findings in this study also confirmed that the overall teaching characteristics are in negative association particularly with the "Enjoyment" and "Pride" emotions, and in positive association with the other four academic emotions of students. These outcomes could be due to or caused by stress emerged through the excessive demands, where the student then may feel delinquent despite making contribution in the classroom; other studies also supported the same outcomes and findings (e.g., Rydell & Henricsson, 2004; Woodcock & Reupert, 2012).

In regard to the role of domain, this study showed that, while the "Pride" was the highest in correlation with the "Enjoyment" academic emotion, the "Helplessness" was the lowest in correlation in case of all domains, and only the "Anger" academic emotion was the lowest in correlation with the characteristics of teaching Mathematics. The finding here indicates that the overall academic emotions acquired by students were not affected significantly by changing the teaching domain, but for "Anxiety" in Mathematics. In addition, the SPS and ELD teaching characteristics were more positive in Biology and Mathematics domains than in English. This finding was also reported by earlier research (Miller et al., 2005).

Yet, while the SPS and ELD were found to be crucial to enhance the "Enjoyment" and "Pride" academic emotions of students, the ELD in particular appeared to be very important for the "Anxiety", "Anger", "Helplessness" and "Boredom" academic emotions, i.e., the ELD showed a positive link with those academic emotions, and negative link with the "Enjoyment" and "Pride" academic emotions for all domains. Those findings were also reported by earlier work, and imply that the impact of the overall teaching process may depend on the efforts spent by the teacher to deliver the scientific message in classrooms (e.g., Darling, 2010; Hightower et al., 2011; Marble et al., 2000; Protheroe, 2009; Sahlberg, 2010; Zuljan & Vogrinc, 2010).

## Conclusion

### Recommendations

The current study was conducted to identify the link between teaching characteristics and academic emotions experienced in real-time by female students crossing three domains in public high schools in Saudi Arabia. Based on the findings of this study, it can be recommended to consider several factors that may impact on the academic emotions of students such as the teaching process and its characteristics; those factors should be taken into account during the teaching process in classroom to reach high level of academic achievements of the students. Therefore, the academic emotions of students need also to be monitored and controlled, and the teaching process should involve different teaching tools and means to be more effective.

The teaching process needs to be pleasant and enjoyable using understandable and illustrative graphics with more clarity and less annoyance or dullness. Therefore, the teaching process and components should be designed according to the discipline and scientific domain to avoid depressing and anxious feelings by students; a successful teaching process in one domain may not work in others. Teachers are also recommended to be cooperative, helpful and obliging with no anger or boredom to stimulate positive feelings of students and inspire them to be more productive.

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In addition, educational administrations and institutions are recommended to enhance the capabilities and skills of the teachers and improve the school environment to influence the positive perceptions and academic emotions of students. To avoid the intensity of negative academic emotions and feelings by students, educators are encouraged to make sure that the pace of the lesson and classrooms, the expectations and materials communicated and delivered to the students, as well as the difficulty of the material are appropriate according to the context of the class and scientific domain.

**Study Limitations**

Although this study was to examine the link between the teaching characteristics and the academic emotions, this link cannot be functioning directly between those two variables, and thus the causality here may be impacted by other unknown intra-class or external factors. This study also did not consider factors related to the individual students such as intrinsic or extrinsic values and norms; thus a future study to consider such intra-individual attributes or traits of the students may be needed.

In addition, this study adopted the real-time and event experience method for the data collection process; yet, this is considered as a self-reporting method which might have been affected by beliefs, perceptions and norms of the research participants about the teaching characteristics or about describing or interpreting their academic emotions and feelings or real-time experiences.

The aim of this study was to investigate the link between the teaching characteristics and academic emotions acquired by female students in their high-school stage crossing English, Mathematics and Biology classes. The idiographic approach and real-time or event experience sampling was adopted to collect data from the research participants in Saudi Arabia. The study found that the links between the teaching characteristics and the academic emotions were obvious, and with very few exceptions, the links were rather similar across the selected domains. This implies that the teaching patterns appear to

play a critical role in enhancing the academic emotions acquired by students in classrooms. The findings of this study are of high importance for the educators as they obviously demonstrate that specific characteristics of teaching linked and relate to the academic emotions of students.

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